INDUSTRIAL APPLICABILITY

The invention provides aromatic polyamide resin moldings whose surface have protrusions that are virtually uniform, fine, and so high in affinity with aromatic polyamide that they are hard to be destroyed.

Further, the invention provides aromatic polyamide film that, when used as base film for a magnetic recording medium, are excel lent in electromagnetic conversion properties and durability.

What is claimed is:

1. An aromatic polyamide resin molding comprising at least one surface that has an R_q root-mean-square roughness of 1.0 nm or more and a 10-point average roughness of 80 nm or less, both of said roughnesses being as determined by atomic force microscopy, and said molding having a tensile Young's modulus of at least 9.8 GPa or more in at least one direction,

in which said aromatic polyamide layer that comprises said surface consists essentially of an aromatic polyamide plus a dissimilar polymer that is not an aromatic polyamide, and wherein said dissimilar polymer comprises 0.1 wt % to 10 wt %,

where H/D is the value given by dividing the average height of the protrusions on the surface by the average diameter of the protrusions and wherein H/D is in the range of 1/40 to 1/2, and

wherein the average diameter of the protrusions on the surface in 30 nm to 300 nm.

2. Aromatic polyamide resin molding as defined in claim 1 wherein the height of highest non-particle protrusion on the surface of said molding is 20 times or less the average roughness of said surface.

3. Aromatic polyamide resin molding as defined in claim 1, in which number of protrusions that are 5 nm or more in height that are formed on said surface is $2\times10^5/mm^2$ or more.

4. Aromatic polyamide resin molding as defined in claim 3, which the number of protrusions that are 50 nm or more in height is $2\times10^5/mm^2$ or less, and cross section of said protrusions taken in a horizontal plane at a height of 5 nm above said surface comprises 1–20% of the total area of said surface.

5. Aromatic polyamide resin molding defined in claim 1, in which number of particle protrusions on said surface is $0.1\times10^4/mm^2$ to $20\times10^4/mm^2$.

6. Aromatic polyamide resin molding defined in claim 5 in which average height of said particle protrusions on the surface of said molding is 10 nm to 75 nm.

7. Aromatic polyamide resin molding as defined in claim 6, in which said particle protrusions comprise an inorganic substance.

8. Aromatic polyamide resin molding as defined in claim 1, including said dissimilar polymer that is not an aromatic polyamide, and in which the solubility parameter of said aromatic polyamide, δa, and the solubility parameter of said dissimilar polymer, δb, satisfy the following formulae:

$$50(MJ/m^3)^{1/2} \leqq \delta a \leqq 70(MJ/m^3)^{1/2}$$

$$|\delta a - \delta b| \leqq (MJ/m^3)^{1/2}.$$

9. Aromatic polyamide resin molding as defined in claim 1 in which said aromatic polyamide layer that comprises said surface consists essentially of an aromatic polyamide plus a dissimilar polymer that is not an aromatic polyamide. and wherein said dissimilar polymer comprises 0.1 wt % to 10 wt % of the total of the aromatic and the dissimilar polymers, in which said dissimilar polymer is selected from the group consisting of at least one of the following polymers: polysulfone, polyetherimide, polyphenylene oxide, polyketone, polycarbonate, polyester, and polyimide.

10. Aromatic polyamide resin molding as defined in claim 9, in which said dissimilar polymer is polysulfone.

11. Aromatic polyamide resin molding as defined in claim 1, further comprising a plurality of particles in an amount of 0.0001 wt % to 1.0 wt %.

12. Aromatic polyamide resin molding as defined in claim 1 in which said moldings are in the form of a film.

13. Method for producing a magnetic recording medium as defined in claim 12, in which an aprotic organic polar solution of an aromatic polyamide and a dissimilar polymer is cast onto the form of support, dried at a desolvating rate of 3–15 %/min, and immersed in a water bath, followed by drying and/or heat treatment in a temperature range whose maximum is not less than the glass transition temperature of said dissimilar polymer and not more than said glass transition temperature plus 100° C., with the flow speed of air at said film surface being 1 m/sec to 30 m/sec.

14. Magnetic recording medium that is produced by forming a magnetic layer over at least one surface of said aromatic polyamide resin molding as defined in claim 1.

15. Magnetic recording medium as defined in claim 14, in which said magnetic layer is a thin metal magnetic layer.

16. Magnetic recording medium as defined in claim 14, in the form of a magnetic tape of 2.3–13 mm in width, 6.5 μm or less in support thickness, 100 m/roll or more in length, and 8 KB/mm^2 or more in recording density.

17. An aromatic polyamide resin molding comprising at least one surface that has a root-mean-square roughness of 1.0 nm or more and a 10-point average roughness of 80 nm or less, both of said roughnesses being as determined by atomic force microscopy, and said molding having a tensile Young's modulus of at least 9.8 GPa or more in at least one direction wherein said molding further has a non-particle index of 80% or more for protrusions 5 nm or more in height, on its surface, and wherein said molding has a value of 1/40 to 1/2 obtained by dividing the average height of the protrusions on the molding surface by the average diameter of the protrusions.

18. An aromatic polyamide resin molding comprising at least one surface that has an R_q root-mean-square roughness of 1.0 nm or more and a 10-point average roughness of 80 nm or less, both of said roughnesses being as determined by atomic force microscopy, and said molding having a tensile Young's modulus of at least 9.8 GPa or more in at least one direction wherein said molding further has a non-particle index of 80% or more for protusions 5 nm or more in height, on its surface,

and wherein the average diameter of the protrusions on said surface is 30 nm to 300 nm, and wherein the height of the highest non-particle protusion on the surface of said molding is 20 times or less of the average roughness of said surface, and wherein the number of protrusions that are 5 nm or more in height that are formed on said surface is $2\times10^5/mm^2$ or more, and the cross sections of said protrusions, taken in a horizontal plane at a height of 5 nm above said surface comprises 1 to 20% of the total area of said surface, and wherein the average height of said particle protrusions on the surface of said molding is 10 nm to 75 nm, said protrusions having an H/D ratio in the range of 1/40 to 1/2, wherein H represents the average height and D represents the average diameter of said protrusions, and wherein said aromatic polyamide layer that comprises said surface

consists essentially of an aromatic polyamide plus a dissimilar polymer that is not an aromatic polyamide, and wherein said dissimilar polymer comprises 0.1 wt % to 10 wt % of the total of the aromatic and the dissimilar polymers.

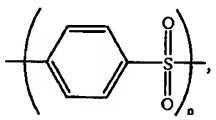
19. An aromatic polyamide resin molding comprising at least one surface that has an Rq root-mean-square roughness of 1.0 nm or more and a 10-point average roughness of 80 nm or less, both of said roughnesses being as determined by atomic force microscopy, and said molding having a tensile Young's modulus of at least 9.8 GPa or more in at least one direction,

in which said aromatic polyamide layer that comprises said surface contains an aromatic polyamide plus a dissimilar polymer that is not an aromatic polyamide,

where H/D is the value given by dividing the average height of the protrusions on the surface by the average diameter of the protrusions and wherein H/D is in the range of 1/40 to 1/2,

wherein the average diameter of the protrusions on the surface is 30 nm to 300 nm.

20. Aromatic polyamide resin molding as defined in claim 1 or in claim **19**, wherein said dissimilar polymer is an aromatic polysulfon polymer which comprises one or more repeating units represented by a formula selected from the following group:



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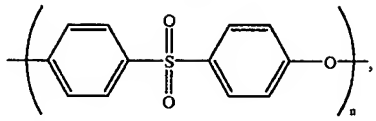

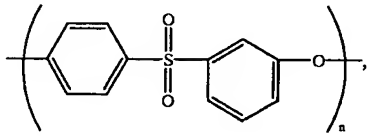

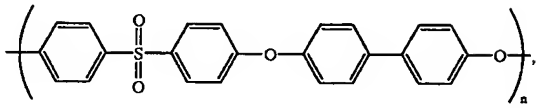

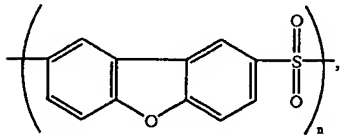

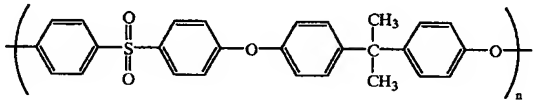

wherein n denotes a positive integer.

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